Chapter 4

Statewide 5 A Day Campaigns: Targeted Initiatives in Connecticut, Kansas, South Carolina, Arizona, and California

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INTRODUCTION

Chapter 3 described how State agencies provide the infrastructure for the national 5 A Day Program to implement interventions at the State and local levels. Even though agencies are licensed by the National Cancer Institute (NCI), there is no Federal categorical funding to support program activities. State 5 A Day coordinators have had to be creative by integrating 5 A Day initiatives into existing programs and generating multiple sources of support.

Through a national partnership between NCI and the Centers for Disease Control and Prevention (CDC), States received an important boost in 1994 and 1995 when CDC provided support for Program activities to about half the States through special Division of Nutrition grants. Simultaneously, NCI, working with CDC, began to supply funds for evaluation. In addition, States have used funds from CDC's Preventive Health and Health Services Block Grant and from the U.S. Department of Agriculture's (USDA) Food and Nutrition Service, including funds from the Nutrition Education and Training Program and the Food Stamp Nutrition Education Program. Most of the programs reported on in this chapter have received funds from at least one of these sources.

The purpose of Chapter 4 is to illustrate, through five case studies, the different approaches States have used to define priorities, find resources, develop new initiatives, and evaluate their programs. Because State programs have evolved independently, and grown as funds have permitted and new partners have signed on, they are not easily evaluated. Compared to research projects, such as those described in Chapters 8 through 11, State programs may be larger in scale, less intense, more subject to confounding factors in the environment, and lacking in good comparison data. Therefore, quasi-experimental, qualitative, and case study methods are deemed the most suitable evaluation approaches.

CONNECTICUT'S 5 A DAY HEAD START INITIATIVE

Serving a population of 3.3 million, Connecticut chose to focus its 5 A Day initiative on families with young children because nutrition education programs begun in early childhood can positively affect health and learning into the adult years (Lawatch, 1990; Splett and Story, 1991; Kelder et al., 1994). Connecticut's Department of Public Health (DPH) selected Head Start, a federally funded enrichment program for 3- to 5-year-old children, as the model site for intervention. Head Start provides an environment conducive to change. Health messages are delivered and reinforced; teachers, children, and parents work together; nutrition education is mandated; and meals and snacks meeting Federal nutrition standards are served. The goal for this 5 A Day initiative is to increase vegetable and fruit consumption and promote increased physical activity among Head Start children and their families, resulting in improved health and reduced risk of chronic disease.

Strategies

The Connecticut 5 A Day Head Start initiative sought to identify and build partnerships at the community, State, and Federal levels; to develop a 5 A Day education model for Head Start; and to continue quality enhancements to meet these objectives. The initiative focused on five areas for intervention: partnerships, parents, teachers, food-service staff, and children.

An important strategy in meeting the objectives was to build infrastructure at DPH. After funding was received from CDC in 1994, the program coordinator recruited a part-time consultant to assist with the development, implementation, and evaluation of the initiative. DPH also established a 5 A Day advisory committee to encourage networking, provide guidance, and build support for the initiative. Educators, parents, and partners contributed to the development of the education model for Head Start, and DPH designed the model with two complementary learning modules, one for children and one for parents.

As the initiative continues to grow, DPH develops new systems for training and distribution; adds new sites, new products, and materials; refines evaluation methodologies; and maintains systems to ensure that objectives are met and that initiative processes stay on target.

Program Design

DPH elicited support from State-level 5 A Day partners, including State and community service agencies, universities, nutrition-related groups, professional chefs, major grocery store chains, and 5 A Day State partners (e.g., Franklin Mushroom Farms). Many of these partners became members of the 5 A Day State advisory committee and continuously provide resources and opportunities for program expansion, such as grocers supporting poster contests and store tours. The Connecticut Department of Agriculture ensures inclusion of 5 A Day at the State "Ag Expo" and funds special projects. Thus, successful public/private partnerships were formed and continue as a result of this initiative.

DPH also selected two communities that were demographically diverse to pilot the educational model for Head Start. To participate in the initiative, each site had to recruit teaching and food-service staff, as well as at least 20 parents. DPH held focus groups with parents and teachers to select methods and materials that would stimulate participation in the initiative and encourage consumption of vegetables and fruit at home and at school.

With the input from the focus groups and consultants, DPH developed the two learning modules to strengthen the bond between home and school for the purpose of dietary change. Both modules built upon problemsolving skills (Singleton, 1994). DPH based the conceptual framework on developing knowledge and skills that lead to increased vegetable and fruit consumption. These include food selection, food preparation, food presentation, and child nutrition. Both modules are also highly interactive and emphasize having fun with 5 A Day. Each module features fictitious characters and links curricula with specially designed teaching aids.

Consultants designed the child module around the adventures of the costumed Captain 5 A Day. Head Start teachers and food-service personnel together attend workshops to become familiar with the Captain 5 A Day curricula, materials for classrooms and mealtime, and nutrition-oriented

resources designed for preschool-age children to further their sensory, cognitive, physical, social, and language development.

The centerpiece of the parent module continues to be the bilingual (English and Spanish) videotapes, "Supermarket Smarts: The 5 A Day Way" and "Ven Y Busca Cinco al Dia en tu Supermercado," featuring 5 A Day Fiona. Consultants selected video as the vehicle for message delivery to show real-life scenarios and highlight perceived barriers and solutions to encourage eating vegetables and fruit. The video transports parents from the classroom to a virtual grocery store where they learn about unit pricing and reading labels as they tour the store. Chefs demonstrate easy and inexpensive ways to select and prepare vegetables and fruit for family meals and snacks. Group discussions centering on children's eating behaviors encourage access to healthy meals and snacks (Hertzler, 1994; Branen and Fletcher, 1994).

DPH continues to refine the initiative evaluation. The first tool, for self-reported pre- and post-intervention assessments, captured child and adult consumption rates of vegetables and fruit, awareness of 5 A Day, food preparation preferences, and demographic data. Other tools used to measure process and outcomes were classroom observations, administrative feedback, workshop evaluation forms, and requests for workshops and materials. As the initiative grows, it changes. New materials and products are incorporated into the learning modules. Consultants continue to monitor and refine evaluation procedures to reflect program changes.

Implementation

The Connecticut 5 A Day Head Start Initiative began with 2 programs as pilot sites in 1995 and grew to more than 21 Head Start sites as of 1999. For further descriptions, see Table 1.

DPH built the education model for children, teachers, food-service staff, and parents. The child module begins with teachers, who participate in one workshop. The focus of the learning is on their role as agents of change for better health, stressing the nutritional benefits of eating more vegetables and fruit while integrating Captain 5 A Day activities into classrooms and at mealtime. Teachers receive Captain 5 A Day materials for their classrooms. The centerpiece of the child module is the Captain 5 A Day Adventure Box with the audiocassette, "The Adventures of Captain 5 A Day." Through this module, children learn skills such as tasting new foods and exploring vegetables and fruit in fun and creative ways. The 5 A Day message goes from school to home via teachers and children. Teachers send home note cards to parents with 5 A Day messages, recipes, and suggestions for physical activity, and children bring home Captain 5 A Day headbands or taster's badges from classroom activities. Through this learning process, both parents and children gain exposure to and familiarity with vegetables and fruit.

The parent module emphasizes skills development for selecting, preparing, and serving vegetables and fruit. Bilingual recipes as well as printed and audiovisual educational materials facilitate learning. In the first project year, parents attended two workshops: one featured chefs from the Connecticut Culinary Institute, and the second featured supermarket tours led by registered dietitians and store produce managers. In the third year of the program, the supermarket tour workshop was eliminated because of the availability of the "Supermarket Smarts" videotape.

Although some food-service personnel attended workshops for teachers, these workshops did not offer specialized culinary training. To bridge this gap, 5 A Day advisory committee partners organized a conference for food-service staff from all participating sites. Culinary demonstrations were followed by kitchen practice sessions. For the culminating activity, participants served 5 A Day entrees and snacks to a group of young children, who favorably judged the recipes. Each attendee left with a collection of 5 A Day recipes.

Evaluation

Evaluation is a continuous process. DPH uses a combination of process and outcome measures to evaluate this initiative. The process measures were as follows: in 1997, 380 adults participated (40 percent were parents; the remainder were Head Start teachers and staff), and the initiative reached nearly 4,000 children; in 1998, more than 4,500 children and adults were exposed to the initiative; and between 1996 and 1997, the initiative reached 97 percent of the Head Start teachers and parents originally targeted. For the outcome measures, both parents and staff continue to positively rate

Table 1. Stages in the Development of the 5 A Day Head Start Initiative in Connecticut

Year	*Head Start Programs*	*Staffing*	*Funding*		*Total*	*Stages*
1994-1995	2	1 (.5 FTE) consultant 1 (.5 FTE) in-kind	CDC, $30,000	Maternal and Child Health Services Block Grant, $5,640	$35,640	Secure partners, plan, develop initiative, design intervention Implement and evaluate
1995-1996			CDC, $10,000		$10,000	Develop workshop training kit
1995-1997	8	3 (1.5 FTE) consultants 1 (.5 FTE) in-kind	USDA, $81,000	State match, $81,012	$162,012	Expand program Evaluate dietary change
1997-1999	11	3 (1.5 FTE) consultants 1 (.5 FTE) in-kind	USDA, $114,225	State match, $114,279	$228,504	Develop audiovisual materials
1998	21	3 (1.5 FTE) consultants 1 (.5 FTE) in-kind	USDA, $121,900	State match, $121,961	$243,861	Refine, evaluate for program effectiveness
1998-1999	21	3 (1.5 FTE) consultants 1 (.5 FTE) in-kind	USDA, $125,980	State match, $125,988	$251,968	Develop train-the-trainer protocol Institutionalize, initiate self-sufficiency

FTE = full-time equivalent.

their workshops. Parents said that they learned most about unit pricing, selecting and storing fruit, and reading labels.

The first preliminary post-assessment, developed in 1995, was a self-reported paper-and-pencil instrument. Parents reported vegetable and fruit intake, 5 A Day awareness, and food preparation preferences. A statistically significant improvement in the fruit intake of children was attained among the intervention group ($p = 0.05$), even though these baseline vegetable and fruit intakes were unusually high (6 to 14 servings per day). Although the survey defined portion size, portion size was not validated.

In 1997, DPH used a more sophisticated evaluation methodology: 31 economically challenged caregiver pairs (parent or grandparent with child) from 6 Head Start sites participated in face-to-face interviews to report vegetable and fruit intake. Staff randomly selected and assigned the caregivers into control or intervention groups; 15 were in the control group, and 16 were in the intervention group. Caregivers in the control group did not attend parent workshops or receive 5 A Day materials, while caregivers in the intervention group did. In both groups, 70 percent were Hispanic, 20 were Black, and 10 percent were White.

Pre-measures and post-measures consisted of a 24-hour recall, a 62-item Block-type food frequency questionnaire (Block et al., 1986), and a 2-day diet record. Consultants asked caregivers to recall their own consumption and that of their child using food models and measuring equipment to standardize serving size measurements. The general linear models procedure in SAS (a statistical software package) was used to determine whether the intervention was effective. Caregivers attending the nutrition education sessions reported consuming twice as many vegetables after the intervention as before (baseline: 0.8 ± 0.7 serving per day; post-intervention: 1.9 ± 0.4 serving; $p < 0.05$). For caregivers, there were no other statistically significant differences between the control and intervention groups (see Table 2). Although there were no significant differences among the two groups of children, the results indicated movement in the right direction. Perhaps the reason why a greater difference was not seen between the groups of children is that both groups participated in Head Start (where vegetables and fruit are served daily), contributing to the daily vegetable and fruit intake of both groups. The Head Start initiative was found to be a positive contributor to increased vegetable and fruit consumption by parents, and because parents are the gatekeepers of their children's home food supply, they may be expected to have a positive influence on the vegetable and fruit consumption of their children. DPH needs to develop more sensitive evaluation instruments to further document the impact of this 5 A Day initiative on the consumption of vegetables and fruit by Head Start children.

Funding and Staff

Connecticut received $30,000 from CDC in 1994. The Maternal and Child Health Services Block Grant contributed $5,640, and the following year

Table 2. Connecticut Vegetable and Fruit Consumption at Baseline and After the Nutrition Education Sessions—Intervention and Control Groups

		Nutrition Education		*Control*	
		Baseline	*After Intervention*	*Baseline*	*Followup*
Fruits	Child	2.0 ± 2.4 (0-3.2)[a]	1.7 ± 0.9 (0-1.8)	1.9 ± 1.4 (0-1.9)	2.0 ± 1.8 (0-2.2)
	Caregiver	0.9 ± 2.2 0-2.0	1.2 ± 0.7 (0-1.5)	0.2 ± 0.5 (0-1.2)	1.2 ± 1.2 (0-1.9)
Juices	Child	1.4 ± 1.1 (0-2.9)	1.4 ± 0.7 (0-2.7)	2.0 ± 1.9 (0-6.1)	1.9 ± 0.6 (0.9-3.0)
	Caregiver	0.5 ± 0.4 (0-2.9)	1.3 ± 0.6 (0-2.5)	0.5 ± 0.8 (0-7.6)	1.3 ± 1.0 (0-2.6)
Juice Drinks	Child	0.3 ± 1.4 (0-2.3)	0.8 ± 1.1 (0-1.5)	0.8 ± 1.1 (0-1.5)	1.1 ± 0.6 (0-2.7)
	Caregiver	0.3 ± 0.8 (0-2.4)	0.5 ± 0.5 (0-2.7)	0.5 ± 0.5 (0-2.7)	0.2 ± 0.4 (0-1.3)
Vegetables	Child	1.5 ± 1.3 (0-4.1)	1.5 ± 0.4 (0-9.1)	0.9 ± 0.5 (0-4.3)	1.3 ± 0.3 (0-5.7)
	Caregiver	0.8 ± 0.7 (0-5.5)	1.9 ± 0.4[b] (0-6.9)	0.9 ± 0.6 (0-6.2)	0.8 ± 0.4 (0-4.0)
Legumes/ Potatoes/ Plantains	Child	1.2 ± 0.9 (0-2.7)	1.5 ± 0.8 (0-3.1)	0.66 ± 0.66 (0-6.4)	1.4 ± 0.2 (0-4.5)
	Caregiver	0.9 ± 0.8 (0-2.0)	1.6 ± 0.1 (0.3-3.9)	1.5 ± 1.5 (0-3.8)	1.6 ± 1.0 (0-3.3)

[a] Serving range.

[b] Statistically significant: $p \leq 0.05$.

CDC added an additional $10,000. These funds enabled the hiring of one part-time nutrition consultant to assist with the development and evaluation of the initiative. In 1995, DPH identified a new funding source, USDA. Through its Food and Nutrition Service, USDA awards funds to States as part of its nutrition education for food stamp participants. DPH, in cooperation with the Connecticut Department of Social Services, submits the 5 A Day Head Start Initiative to USDA as part of the State nutrition education plan. USDA dedicates these funds to nutrition education for the food stamp population unless a waiver is granted. USDA granted DPH a waiver to work with other economically challenged individuals in Head Start. This Federal funding requires a dollar-for-dollar State match. DPH contributes portions of in-kind salaries for the project director, coordinator, and other State personnel and absorbs the cost of storing and distributing Connecticut 5 A Day materials. This combination of Federal and State resources now supports the initiative at about $250,000 annually. The grant funds three part-time nutrition consultants (1.5 full-time equivalents) and supports the development, production, and distribution of 5 A Day products and materials. Table 1 also

provides information on staffing and funding throughout the various stages in the development of the 5 A Day Head Start Initiative in Connecticut.

Next Steps

DPH decided to institutionalize the initiative to encourage sustainability among local Head Start programs as well as to respond cost-effectively to the increasing number of requests for 5 A Day workshops. In the future, consultants will hold regional workshops using the train-the-trainer model. A turnkey kit will provide protocols and materials for implementation in the near future. Materials are now available to Head Start and other early childhood education programs throughout the State. DPH encourages early childhood programs to look to their communities for additional support, such as having hospital chefs provide food demonstrations to parents and staff. Consultants will continue to make presentations to State and national audiences, enhancing the technology transfer of this initiative to other early education programs.

Lessons Learned

The partnerships, as well as the collaboration between Federal and State funding sources, provided the impetus for the success of the Connecticut initiative and in turn catalyzed the development of a strong 5 A Day public/private partnership. The partnerships created with participating sites have generated support for communitywide interventions and set the stage for the long-term continuation of this initiative. Additionally, early intervention (with young children) through multiple venues with unique experiential materials adds to the initiative's fruition. Working with children, parents, and teachers turned out to be the key to success of the educational model, learning modules, and materials. This was especially important for Connecticut's Hispanic Head Start families, and the bilingual program and materials greatly enhanced the penetration of the 5 A Day messages. The greatest barrier has been for busy parents to find the time to attend workshops.

In short, DPH built an innovative, transferable education model through this 5 A Day initiative, using Head Start as the gateway. This model provides other Head Start programs and various early childhood education settings with a valuable resource to encourage family health-related behavior change.

KANSAS LEAN 5 A DAY IN SCHOOLS INITIATIVE

With a population of 2.5 million (1990), Kansas chose to focus its efforts on elementary-school students in the classroom and cafeteria, with outreach to parents and/or caregivers. The overall goal of the Kansas LEAN (Leadership to Encourage Activity and Nutrition) 5 A Day in Schools Initiative was to increase opportunities for students to taste a variety of vegetables and fruit and to learn about their importance in the overall diet. Specific objectives were to increase the number and variety of vegetable and fruit servings consumed by students, increase the variety of vegetable and fruit items available through the school cafeteria, and increase opportunities for students to eat vegetables and fruit at home, including self-prepared items.

The project team designed strategies that they believed would affect the environment and increase students' knowledge as well as provide incentives for behavior change to all participants. They provided school food services with tested-quantity food recipes. Trainers gave teachers 5 A Day materials and trainings that were coordinated with cafeteria recipes and integrated easily into core subject areas. Students took home to parents practical, low-reading-level information on how to purchase, store, and prepare vegetables and fruit. Local supermarkets offered store tours for students, home-size versions of the school cafeteria recipes, and coupons for vegetables and fruit that students were learning about in class. A CDC 5 A Day evaluation grant funded the creation and testing of recipes and the development of some of the materials. The LEAN program grants from the Kansas Health Foundation and money from the Bureau for Health Promotion of the Kansas Department of Health and Environment (KDHE) funded all staff time and travel, some materials development, mailing costs, and the data analysis. Local supermarkets funded the coupons. The contributions of all partners in the Kansas LEAN 5 A Day in Schools Initiative are delineated in Table 3.

Table 3. Kansas LEAN 5 A Day in Schools Partners

Organization Name	*Activity*	*Annual Funding*
Kansas LEAN, Kansas Department of Health and Environment, Bureau for Disease Prevention and Health Promotion	Overall project coordination, training and technical assistance, data entry and analysis of outcome measures, printing costs for 50,000 each of 12 study prints and reprinting cookbook/ purchasing guide and low-literacy materials, and supplemental funding for pilot sites	In-kind + $64,000
NCI National 5 A Day Program	Seed fund for the elementary school pilot project; overall guidance for the initiative in elementary schools; and identification of existing resources, including the 5 A Day speakers kit	$76,000
Division of Nutrition and Physical Activity, Centers for Disease Control and Prevention	Development of 22-item food frequencies for vegetables and fruit and for grain foods, in collaboration with the University of Texas Health Science Center	In-kind
University of Kansas Work Group on Health Promotion and Community Development	Paid contract for data entry and analysis of process measures	N/A
Kansas State University Department of Hotel, Restaurant, Institution Management and Dietetics	Paid contract for development and testing of school food-service recipes, identification and development of elementary school resources, training and technical assistance onsite, and some data collection	N/A
Dillon Stores, a wholly owned subsidiary of Kroger, Inc.	Provision of fresh fruits and vegetables for tasting parties in classrooms associated with study print activities, presentations in schools by produce managers, and underwriting of coupons for discounts on vegetables and fruit	In-kind
Locally owned, independent grocers	Provision of fresh fruits and vegetables for tasting parties in classrooms associated with study print activities, presentations in schools by produce managers, and underwriting of coupons for discounts on vegetables and fruit in smaller communities where Dillon Stores are not available	In-kind
Nutrition Services Office, Kansas Department of Education	Dissemination of 5 A Day materials to school food service staff and inclusion of 5 A Day concepts in training for school staff	In-kind
Kansas State Research and Extension	Dissemination of materials and provision of training in communities	In-kind
Local health departments	Implementation and evaluation of local initiatives and assistance in school activities	In-kind
School districts	Implementation and evaluation of school-based initiatives and participation in training	In-kind

Program Design and Development

Constructs from several behavioral theories were used to design the initiative. Activities to increase the availability and accessibility of vegetables and fruit in the school cafeteria, for snacks and parties, and at home were based on the Social Cognitive Theory (Bandura, 1986). The activities were designed to change awareness, knowledge, and attitudes, while increasing preferences for vegetables and fruit and enhancing self-efficacy. Skills-building instruction, demonstrations, and tasting parties facilitated trial behaviors, in accord with the Stages of Change Model (Prochaska and DiClemente, 1992).

To plan the initiative, the project staff conducted focus groups in several communities with school food-service staff, teachers, students, and parents. Information was gathered about resources, incentives, dissemination and training strategies, and student preferences. The focus groups, grocery store produce managers, and produce wholesalers identified five vegetables and fruit that were generally available in fresh and processed forms, were reasonable in cost, but were not listed among the students' favorites. The project team chose food items not listed as favorites so that they could introduce new vegetables and fruit to the students and increase variety in their regular intake. Teachers asked for a smorgasbord of resources, including recipes, point-of-purchase promotions, student contests, integrated classroom activities, posters, and fun facts. As a pilot test, training was provided in two communities to teachers, food-service staff and managers, and school administrator support staff, after which the staff members chose the activities that they would implement over the next 5 months. Regular, onsite, and telephone technical assistance was provided to participating schools (Harris et al., 1998).

Process Measures and Results

Two pilot communities were selected based on their size and history of cooperation with the Kansas LEAN staff and the Program's partners. The medium-size community was typical in size of larger Kansas towns, and the smaller community was typical of the more rural communities in the State. In the medium-size pilot community (population 40,000), 63 percent of the elementary grade teachers participated, implementing 47 percent of the activities. School food-service staff prepared and served 24 of 25 recipes and implemented 11 of 38 suggested activities and displays. Observations of students taste-testing new recipes were completed by 61 percent of teachers among 64 percent of the students. An average of 46 percent of the students in grades 1 through 5 tried the new recipes.

In the smaller pilot community (population 1,200), 100 percent of the teachers participated, using 33 percent of the materials. The school food-service staff also prepared and served 24 of 25 recipes and implemented 30 of 38 suggested activities and displays. Observations of students taste-testing new recipes were completed among 44 percent of the students. Generally, 100 percent of students in grades 1 through 3 and 85 percent of students in grades 4 through 6 tried the new recipes. The overall satisfaction was good, although teachers suggested that the number of resources provided at one time be limited and that the intervention be extended so that it would be longer than 5 months.

Evaluation

A grant from CDC and NCI funded an outcome evaluation study. Self-administered, 22-item, pre-intervention and post-intervention vegetable and fruit frequency questionnaires (administered in mid-October and early April, respectively) were answered by 110 students (40 percent) in the medium-size community and by 72 students (99 percent) in the smaller community. The questionnaires were developed by CDC in collaboration with the University of Texas Health Science Center (Byers et al., 1997). Many teachers in the medium-size community failed to administer both the pre-intervention and post-intervention survey, explaining the low percentage of evaluation data available for that group. Teachers' incentives were based on intervention, not data collection, so these teachers were not motivated to seek a high participation rate in the two surveys.

KDHE epidemiologists analyzed survey data for changes in consumption for each specific food group, total vegetable and fruit consumption, and the variety of vegetables and fruit consumed. Epidemiologists conducted each comparison for all students and for those students defined as at risk based upon their being below the 50th percentile for either variety (fewer than 15 different items reported) or for low total vegetable and fruit consumption (fewer than 90 total vegetables and fruit consumed per month). Changes for all students were not significant in either pilot community, but changes in the at-risk groups were both significant and impressive. In the medium-size community, the at-risk students (n = 46) reported a mean increase of 119 percent, from about 37 to about 82 servings per month ($p = < 0.01$). Variety for this group increased 33 percent, from a mean of 9.5 different items vegetables and fruit to a mean of 12.6 different items. In the smaller community, the at-risk students (n = 75) reported a mean vegetable and fruit increase of 92 percent, from about 45 to 86 servings per month. Variety for this group increased 35 percent, from a mean of 10.5 different items per month to a mean of 13.8 different items. These changes in the at-risk group are extremely impressive and likely can be attributed to the intervention.

Statewide Implementation

The materials developed through this initiative have been disseminated statewide through one mailing of free materials to over 4,800 teachers, school nurses, school food-service directors, and Kansas State University Extension Family and Consumer Science agents. These groups have the potential to have an impact on more than 250,000 children in schools and youth organizations across Kansas. Funds have not been made available for further dissemination of these resources.

Lessons Learned

Children and youth are important target groups for 5 A Day activities, and these groups can be accessed through schools, youth groups, and childcare centers. This project demonstrated that school-based 5 A Day interventions have the potential to affect students' behaviors and affect the school environment. Despite initial recommendations for a smorgasbord of materials from teachers, the quantity of information offered was found to overwhelm them. Management of timed, progressive mailings cost more than the available resources allowed, so it was not possible to add this improvement. The development and testing of quantity school food-service 5 A Day recipes, combined with point-of-purchase materials and classroom ideas, were valued by schools and enjoyed by the students. Parents of all reading abilities appreciated simplified materials that they could read quickly. Finally, although supermarkets and local grocers make excellent partners for a 5 A Day initiative, sustaining statewide programs requires the existence of both producer organizations that will support ongoing 5 A Day programs and long-term, dedicated funding from the State health department, rather than in-kind contributions alone.

SOUTH CAROLINA'S 5 A DAY PROGRAM

As a State with a population of 3.5 million (1990), South Carolina chose to focus on primary prevention for children in school. It was recognized that improvement was needed in children's eating patterns. The principal strategies for the State 5 A Day Program were to increase public awareness, knowledge, and support for policy and environmental change; build technical capacity by providing training and consultation to leaders, school staff, and community organizations; provide an information clearinghouse; develop and mobilize advocates; and support local programs.

Partners

Partnerships are the cornerstone of South Carolina's 5 A Day Program. At both the State and community levels, partnerships include nutritionists; teachers; health educators; school food-service workers; nurses; agricultural extension and marketing staff; and leaders in community groups, churches, and businesses. The South Carolina Nutrition Council provided leadership in planning and implementing school-based 5 A Day activities. For the African-American community, health promotion partnerships were established with barbers and beauticians, churches, health care

providers, professional and fraternal associations, the media, and community leaders.

National partnerships also were important for the success of the State program. These partners included the California-based Dole Food Company; NCI's 5 A Day Program, which provided training and ongoing technical assistance; the Produce for Better Health Foundation (PBH), which provided an industry partner; and CDC, which supported development of the African-American community brochure.

Rationale and Development of the School Program

In 1995, South Carolina conducted a Youth Behavioral Risk Factor Survey (CDC, 1996a), which showed that fewer than one in five high school students reported eating five or more servings of vegetables and fruit each day. This compared unfavorably with the national figure of nearly 30 percent of high school students eating five servings a day (CDC, 1996a). A national study of children ages 2 through 18 indicated that children ate, on average, only 3.4 servings of vegetables and fruit daily (NCI press release, 1997). A South Carolina study of fourth-grade students used a 24-hour recall method and found that only 21 percent of the students had eaten raw vegetables on the previous day, whereas 65 percent reported eating french fries or potato chips (Anderson, 1995).

The seven strategies recommended in CDC's *Guidelines for School Health Programs To Promote Lifelong Healthy Eating* (CDC, 1996b) served as underpinnings for South Carolina's 5 A Day Program in schools. The initiative began with collaboration between South Carolina's 5 A Day Program and the State Department of Agriculture, the State Department of Education, the University of South Carolina, and other organizations affiliated with the South Carolina Nutrition Council that wanted to find ways to improve school-based nutrition education.

In 1996, the State Nutrition Council's 5 A Day subcommittee became aware of the Dole Food Company's "5 A Day Adventures" CD-ROM and invited the company's director to present the program. Initial enthusiasm was high, and members began distributing information about the CD-ROM to schools throughout South Carolina early in 1997. In March, the State Department of Agriculture helped develop the *Fruit and Vegetable Fun Facts* coloring book and the companion brochure, *Win the 5 A Day Challenge*. The coloring book was designed for preschool through lower elementary grades and featured South Carolina produce and 5 A Day facts. The Office of School Food Services mailed letters with ordering information for the materials to about 600 teachers and other school personnel in May 1997. Several professional association newsletters, including USDA's *Market Bulletin* and the State Health Insurance Plan's *Prevention Partners*, featured 5 A Day articles and information about "5 A Day Adventures."

Process Measures and Results

In September 1997, the 5 A Day subcommittee prepared a strategic plan facilitated by the University of South Carolina. Three objectives were set for June 1998: 1) 50 percent of elementary schools (300 schools) will have the "5 A Day Adventures" CD-ROM; 2) 25 percent of those 300 (75) will use it in some way; and 3) 5 percent of those 300 (15) will integrate it into cross-curricular activities. These objectives were evaluated by tracking the distribution of CD-ROMs through information provided by the Dole Food Company and by telephone surveys of CD recipients conducted in May 1997 and May 1998.

The measures chosen for evaluation were the number of elementary schools that ordered CD-ROMs and "5 A Day Adventures" support materials (cookbooks and growth charts); the volume of materials that were distributed; and use of the CD, especially in cross-curricular activities.

Surveys conducted by health department staff in May 1997 and May 1998 asked how recipients of the CD-ROM actually used the Program. In May 1997, questionnaires were mailed to the 358

schools that had received the CDs. After telephone followup for nonrespondents, a total of 129 survey forms were returned, for a response rate of 36 percent. Of 74 respondents who answered the question about CD-ROM usage, 22 percent said they were not using it, 30 percent used it with individual students, 23 percent used it with small groups, and 7 percent used it as an information source. About 17 percent of the 74 respondents reported integrating the CD and related materials into core subjects, such as science and math.

This information was used by the State Nutrition Council to design training activities for teachers to help them use the materials with small groups and in lesson plans for core subjects. Between September 1997 and June 1998, the Nutrition Council conducted more than 40 presentations, demonstrations, and exhibits. Venues included conferences for school nurses; health educators; Healthy Schools/Healthy South Carolina participants; school food-service coordinators; and the South Carolina Association of Health, Physical Education, Recreation, and Dance. An estimated 5,000 individuals attended these presentations, and about 2,500 information packets were distributed. In addition, 15 training sessions on the use of CD-ROMs were held for elementary school teachers and staff.

The distribution rate of CD-ROMs and support materials suggested that the State Nutrition Council's promotional efforts were effective for increasing dissemination of the materials (Table 4). Compared with the results in 1994, the first year that the Dole CD was offered, the total number of CDs distributed increased more than 500 percent by 1996, with the number distributed annually increasing from 728 to 4,087 between 1996 and 1997. Use of the cookbooks and growth charts more than doubled each year.

A second qualitative evaluation with teachers was conducted in May 1998 following the training. Questionnaires were mailed or faxed to 139 schools that had received the CD-ROM in 1998. This time, the response rate was 61 percent. Respondents reported using the CD in a variety of ways—58 percent reported using it as an information source, 50 percent used it for individual play time, 42 percent used it with small-group teaching, 39 percent made it available for teachers to borrow, and 8 percent used it for teacher training. Most positively, 53 percent reported integrating the materials into core subject areas. Of those who integrated the content, 77 percent chose science, 39 percent chose language, 29 percent chose math, and 19 percent chose the arts. These results suggested that the Nutrition Council's teacher training had been successful and that the State's objectives had been greatly exceeded. Almost 75 percent of the State's elementary schools had received the materials, compared with the original target of 50 percent. Of those that received the materials in 1998, nearly 60 percent of the respondents had used them, compared with the expected 25 percent, and more than 50 percent of the respondents reported using them with core subjects, compared with the expected 5 percent.

Lessons Learned

Much emphasis has been placed in South Carolina on understanding cultural preferences and on featuring vegetables and fruit preferred by South Carolinians. Current program efforts include developing and pilot-testing supplementary materials for teachers to use with the CD-ROM program and offering training for school personnel. In 1998, the South Carolina 5 A Day Program established an Internet Web site with educational activities for children and links to other 5 A Day sites.

The partnership with the South Carolina Nutrition Council and the technical support provided by NCI's 5 A Day Program staff have been essential to the successful school promotion effort. During 1996 and 1997, the South Carolina 5 A Day Program had five different coordinators. The Nutrition Council provided continuity of leadership, and NCI provided training and consultation to each State coordinator.

THE ARIZONA GROWN/5 A DAY FOR BETTER HEALTH PROGRAM

In *Arizona 2000—Plan for a Healthy Tomorrow*, the Arizona Department of Health Services (ADHS) identified improving dietary habits and increasing physical activity as the top health objectives for preventable diseases related to lifestyle for the State's population of 3.7 million (as

Table 4. Annual and Cumulative Distribution of Dole 5 A Day Materials to South Carolina Elementary Schools, 1994 to December 1998

	Calendar Year 1994	*Calendar Year 1995*	*Calendar Year 1996*	*Calendar Year 1997*	*Calendar Year 1998*
Annual Distribution					
Elementary Schools Placing First Order	62	44	80	246	47
Elementary Schools Placing an Order	62	50	111	335	107
Dole 5 A Day CD-ROMs	146	114	728	4,087	1,313
Dole Cookbooks	195	716	1,002	2,738	6,489
Dole Growth Charts	135	673	1,043	2,399	6,585
Cumulative Distribution					
Participating Elementary Schools (Unduplicated Count)	62	106	186	432	479
Dole 5 A Day CD-ROMs	146	260	988	5,075	6,388
Dole Cookbooks	195	911	1,913	4,651	11,140
Dole Growth Charts	135	808	1,851	4,250	10,835

of 1990) (ADHS, 1993). Although Arizona is the third-largest producer of vegetables and citrus fruit in the United States, its Behavioral Risk Factor Surveillance System (BRFSS) (ADHS, 1991) showed that more than 80 percent of adults reported eating fewer than five servings of vegetables and fruit each day.

Program Goal and Structure

The Arizona Grown/5 A Day for Better Health Program is a collaboration between the Arizona Department of Agriculture, which conducts the Arizona Grown™ program, and ADHS, the NCI-licensed State health authority for the national 5 A Day Program. The goal of the Arizona Grown/5 A Day Program is to increase consumption of vegetables and fruit, including Arizona produce. Its objectives are to increase consumer and food industry awareness of the availability and quality of Arizona-grown produce and to provide the public with information on the significant health benefits of vegetable and fruit consumption.

The Arizona Grown/5 A Day Program was launched in September 1993 by the Arizona Department of Agriculture and ADHS. Budget decisions, program planning, implementation, and evaluation are conducted jointly. The Arizona Department of Agriculture serves as the lead agency for retail and agriculture efforts, whereas ADHS serves as the lead agency for community education and collaboration with health professionals. Key staff from the two agencies meet monthly, and working groups, including industry partners (such as ABCO, Albertson's, Bashas, Fry's, IGA, Safeway, Smith's, and Smitty's Food and Drug), meet frequently to work on materials and promotional events. No 5 A Day coalition has been formed in Arizona, so State efforts can focus on expanding the Arizona Grown program.

Target Population, Strategies, and Channels

To take advantage of NCI resources, a target audience identical to the one chosen by NCI was

selected for the Arizona Grown/5 A Day Program, namely, "people who are trying to increase their fruit and vegetable consumption but eating fewer than 5 daily servings of fruits and vegetables" (NCI, 1993). The Arizona Grown/5 A Day Program includes activities in the media; retail grocery stores; and statewide community education channels, such as daycare settings, schools, and USDA's Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) clinics.

A consultant who is also a registered dietitian is the media spokesperson for the Arizona Grown/5 A Day Program. Media efforts include monthly updates of retail and community program activities and a generic harvest calendar featuring seasonal Arizona Grown-recommended vegetables and fruit as well as 5 A Day recipes. Collaboration with NCI's Cancer Information Service (CIS) has been key because the program's monthly materials are distributed through the CIS's 1-800-4-CANCER toll-free number.

Retail participation has increased from three to eight supermarket chains since the launch of the program in 1993. This represents 70 percent of the retail grocery outlets in Arizona. Participating retailers have conducted many successful activities, including a coloring contest, consumer recipe contests, 5 A Day Week promotions, printing of bags with 5 A Day promotions (7.5 million bags with a customized 5 A Day fitness message printed by one chain), and supermarket tours for children.

Community education activities are carried out by community education contacts established in each of the State's 15 counties. Activities are conducted through collaborative (rather than contractual) arrangements, and State support includes the provision of materials, technical assistance, and training. Innovative activities resulting from State support have been conducted in schools and senior centers and at community events. Twelve rural local agencies conduct process and outcome evaluations of 5 A Day activities through the State-funded Community Nutrition Program (CNP). In the 1998-1999 school year, CNP agencies and the county health department in the Phoenix area began introducing a 4-session Arizona Grown/5 A Day curriculum for more than 5,000 first- through third-grade students; the curriculum links classroom instruction with a 5 A Day produce tour in a retail grocery store.

Funding

An initial $60,000 received from the Arizona Iceberg Lettuce Promotion Council was used for 2 years to fund the registered dietitian/media spokesperson and program materials, such as brochures and posters. ADHS provided a half-time nutritionist, and the Arizona Department of Agriculture assigned 1.5 full-time equivalent professional staff; both agencies gave additional in-kind support.

In 1996, the agriculture industry obtained $25,000 from the legislature for the Arizona Grown program. A 50-cent private match is required for each State dollar. In 1997, State funds generated by the private match were increased to $50,000 for promotion of all types of products grown in Arizona. Private matches from produce growers support the media component of the Arizona Grown/5 A Day Program and the harvest calendar and school materials.

In 1997, the Arizona Department of Agriculture provided more than $80,000 in support for the Arizona Grown/5 A Day Program, and the ADHS supplied nearly $50,000, totaling more than $130,000. For full-time equivalent staffing, the Arizona Department of Agriculture contributed 0.6 professional staff, whereas ADHS provided 0.45 professional staff, a decrease for both agencies from earlier levels. ADHS also gave $390,100 to local agencies to facilitate

involvement of CNP, which implements the 5 A Day intervention for schoolchildren.

Trends in Consumption

Arizona has included CDC's optional vegetable and fruit module in the BRFSS since 1991, and the proportion of adults who reported eating five or more servings per day increased from 17 percent in 1991 to 24 percent in 1996. Consumption increases in specific vegetables or fruit recommended in the Arizona Grown/5 A Day promotions were observed, including green salads (from 20 to 30 percent), juices high in vitamin C (from 38 to 48 percent), and carrots (from 7 to 12 percent). However, the 1996 consumption data reported in the BRFSS leveled out at 24 percent of adults reporting five or more daily servings. This plateau corresponded to lower funding and decreased media time in the last half of 1995 and the first half of 1996.

From July through December 1995, a telephone survey of 3,600 adults, more extensive than the BRFSS, was conducted to assess dietary intake, awareness of the 5 A Day message, and cardiovascular disease risk factors. The survey was funded by a 5 A Day evaluation grant from NCI, CDC, and the Federal Preventive Health and Health Services Block Grant to Arizona. Survey results were weighted to represent the population of Arizona and contained county-specific data for all but three rural counties.

The 1995 survey revealed Arizona adults' mean consumption of vegetables and fruit (including legumes and excluding fried potatoes) to be 3.3 servings per day, with a median of only 2.5 servings. Hispanic adults reported the fewest servings (2.4 servings/day), followed by African-Americans (2.9 servings/day), Native Americans (3.2 servings/day), Whites (3.6 servings/day), and Asian-Americans/Pacific Islanders (3.9 servings/day).

Twenty-seven percent of Arizonans surveyed reported hearing of the 5 A Day Program, and 72 percent of those respondents correctly indicated that "5 A Day for Better Health" means consuming at least five servings of vegetables and fruit a day. One-quarter of those surveyed reported learning of 5 A Day through media such as television, radio, newspapers, or magazines, whereas only 3 percent reported learning of it in grocery stores. A county-by-county comparison showed that awareness of 5 A Day was greatest in Maricopa County (31 percent), where media efforts had been most intensive. Awareness in the other 14 counties ranged from 16 to 30 percent.

Institutionalization and Adoption

Arizona Grown/5 A Day Program media efforts have resulted in several ongoing media features. The food section of *The Arizona Republic*, Arizona's largest newspaper (circulation 350,000), now features a monthly Arizona Grown/5 A Day Program shopping list with information on vegetables and fruit being harvested in Arizona and 5 A Day Program recipes. KPNX-TV, the NBC affiliate in Phoenix, carries two live segments every month: 5 A Day on the noon news and a morning spot featuring Arizona Grown-recommended produce.

State-funded CNP public health nutritionists have implemented most of the Arizona Grown/5 A Day Program community education activities without dedicated NCI 5 A Day Program funding. Their decision to move from a wide variety of community-based nutrition activities to a more focused and standardized 5 A Day intervention for schoolchildren resulted in more than 5,000 students receiving 5 A Day lessons in the 1998-1999 school year. Linkage with school-based programs such as USDA's Team Nutrition is providing new opportunities to reach students with 5 A Day activities (e.g., school gardens). Standardized evaluations will be conducted to assess the effectiveness of the program.

Incorporating 5 A Day into other public health programs has proven to be a successful and value-added way of reaching underserved audiences. For example, all Arizona WIC clients receive a 5 A Day message on the protective holder for their identification folder. The CDC-funded WISE-Woman project, a cardiovascular disease screening program for uninsured or underinsured women age 50 or older, now features a 5 A Day component.

Lessons Learned

Distribution of State-developed materials on a monthly basis through NCI's toll-free CIS number has been key in the success of both the Arizona Grown/5 A Day Program media efforts and community education programs. Between 1994 and 1997, nearly 4,000 Arizonans called and requested

State-specific Arizona Grown/5 A Day Program materials.

Staffing for the 5 A Day State coordinator is inadequate (0.4 full-time equivalent), and the Arizona Department of Agriculture staffing for 5 A Day activities has decreased. This situation has important implications because of increased State funding for the Arizona Grown program and the need, as identified by partners, to expand Arizona Grown/5 A Day Program nutrition activities into health care and food-service channels.

The initial decision not to form a statewide 5 A Day coalition was made so that efforts would focus on expanding the Arizona Grown program. However, long-range funding for the Arizona Grown/5 A Day Program is more difficult without a formal coalition. More positively, linkage of Arizona Grown with NCI's 5 A Day for Better Health Program has been very successful. This is due to excellent collaboration between State agencies, industry support, a partnership with the University of Arizona's NCI-funded research project (5 A Day for the Overlooked Worker, described in Chapter 9), and participation from public health nutritionists throughout the State. At this time, there are no plans for a statewide 5 A Day coalition in Arizona. The 5 A Day message has been incorporated into the programs of the Arizona Nutrition Network, a nutrition education partnership targeting food stamp-eligible individuals. The initial target audience for the Arizona Nutrition Network messages consists of low-income Hispanic women and their children. A combination of social marketing strategies and more traditional nutrition education approaches will be used to reach the target audience in six Arizona counties.

CALIFORNIA 5 A DAY—FOR BETTER HEALTH! CAMPAIGN

As noted earlier, the national program grew out of a 5-year NCI grant awarded to California in 1986. When the prototype California 5 a Day for Better Health! Campaign (1986-1991) was transferred to NCI in 1991 (Foerster et al., 1995), the California Department of Health Services (CDHS) continued to develop targeted campaigns for population segments and to monitor statewide vegetable and fruit intake for this State of 30 million persons (as of 1990). A bill sponsored in 1992 by the California Dietetic Association that would have provided State funds for those campaigns was passed without an appropriation because of the State recession; nonetheless, it directed CDHS to continue the California 5 A Day Campaign by using Federal or private monies. Since then, the department has marshaled resources from multiple sources, including the Federal Preventive Health and Health Services Block Grant, CDC/NCI evaluation grants, the USDA Food Stamp Nutrition Education Program, and a foundation (The California Endowment).

Strategic Priorities and Leadership

Over the past decade, State priorities have been based on strategic recommendations made in 1992 by the original industry steering committee and other interested individuals. Rather than continuing any State initiatives targeting the general population, they recommended that California develop social marketing campaigns to complement NCI's 5 A Day Program, with the priorities being children, Hispanic adults, restaurants/food-service outlets, and community coalitions. With this broader scope of work, the steering committee grew from the original 12 industry members starting in 1988 to well over 60 organizations in 1998, including three sister State departments; most of the State's vegetable and fruit marketing orders, boards, and commissions[1]; and the American Cancer Society. Using skills developed during the original NCI capacity-building grant, CDHS has continued conducting the biennial California Dietary Practices Survey (CDPS) and employing social marketing staff on contract through the nonprofit Public Health Institute.

Children First

In mid-1992, $300,000 of the State's Preventive Health and Health Services Block Grant from CDC became available annually for the California 5 a Day—For Better Health! Campaign. Contract staff

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[1] *Growers of a particular commodity assess themselves a specific fee, the revenues of which are pooled into a fund. More information on marketing orders can be found in Appendix B.*

members were recruited to develop what became the California Children's 5 a Day—Power Play! Campaign for fourth and fifth graders and their parents, which included an intervention delivered in school; a community youth organization; and media, supermarket, and farmers market channels (Foerster et al., 1998a) (see also Chapter 10). In 1997, the positive results of the Power Play! evaluation study led to an award by The California Endowment of $4.2 million over 5 years to CDHS for rolling out Power Play! in successive media markets. The grant also was matched by USDA food stamp Program funds, thereby providing longer awards for the regional coalitions and more materials for community partners that targeted children from low-income households. By 1999, Power Play! coalitions were in operation in the Fresno, Los Angeles, Sacramento, and San Diego media markets. The Kern County, Central Coast, Far North, Inland Empire, Orange County, and San Francisco Bay Area media markets were on board by 2001, and well over 40 percent of the State's 1 million fourth and fifth graders are expected to be involved in Power Play! activities each year.

The Latino 5 a Day Campaign

The 1991 CDPS showed an unexpected 18 percent drop in vegetable and fruit consumption among Hispanic adults compared with 1989 figures, which contrasted with an 8-percent increase among African-American and White adults during the prototype campaign (Foerster and Hudes, 1994). Based on the new data, an additional $460,000 was made available over 2 years from the Federal Preventive Health and Health Services Block Grant to develop a special Latino campaign that targeted the State's estimated 4 million adults who access the Spanish-language mass media. Focus groups were conducted; a special logo was developed; a variety of collateral materials, including a consumer guía (guide), were produced; and all materials for children and parents in the Power Play! campaign were adapted and translated into Spanish. The new California Latino 5 a Day Campaign was announced during National 5 A Day Month in September 1994, and the new guide was made available through NCI's toll-free CIS number. Starting in 1995, public service announcements (PSAs) were developed and

placed with Spanish-language television and radio outlets across the State, while other collateral materials were used widely at Latino festivals and in other community venues. The PSAs were aired more than 500 times on Spanish-language radio and television stations in 7 media markets, with media exposures totaling more than 17 million between 1994 and 1996.

Between 1993 and 1995, the reported consumption of vegetables and fruit by Hispanic adults jumped 34 percent, from 3.5 to 4.7 servings, the highest of the three major ethnic groups surveyed. These findings were instrumental in securing a grant totaling $2 million over 5 years from The California Endowment to enhance the campaign through a Latino spokesperson program as well as through the development of special materials for ethnic festivals, educational videos, and cross-promotions in retail grocery stores and farmers markets.

The Network 5 a Day Campaign for Lower Income Families With Children

In 1995, CDHS responded to a request for applications from USDA's Food and Nutrition Service to develop nutrition support networks using social marketing approaches. This large-scale initiative targeted an estimated 2.8 million food stamp recipients and similar low-income households, with the purpose of improving dietary intake. The initial 1-year planning grant required CDHS to establish a large public/private coalition, develop a strategic plan addressing overall healthy eating and physical activity, and identify State in-kind

funds that would qualify for ongoing Federal matching funds from the Food Stamp Program. The first-year Food Stamp Nutrition Education Program plan was approved for $2.8 million late in 1996 (CDHS, 1996a). By building upon the infrastructure already established for the California 5 a Day—For Better Health! Campaign, the new program accomplished these objectives within 1 year, with the coalition growing to more than 200 partners.

The design of the strategic plan for the new California Nutrition Network for Healthy, Active Families built on the State's two social marketing campaigns, California Project LEAN and the California 5 a Day Campaign. It was organized around three 2-month promotional periods each year. In the spring, the promotions address low-fat eating or 30 minutes of daily physical activity, and in the summer and fall, the promotions feature the 5 A Day message. All 3 promotions urge 30 minutes of daily physical activity and are delivered bilingually through public service mass and ethnic media, retail grocery, and community channels. Starting in 1999, PBH (NCI's public/private partner) retail merchandising materials were used and adapted where necessary for the California Nutrition Network target populations. By April 1999, nearly 500 of the State's 2,000-plus supermarkets were scheduled to participate.

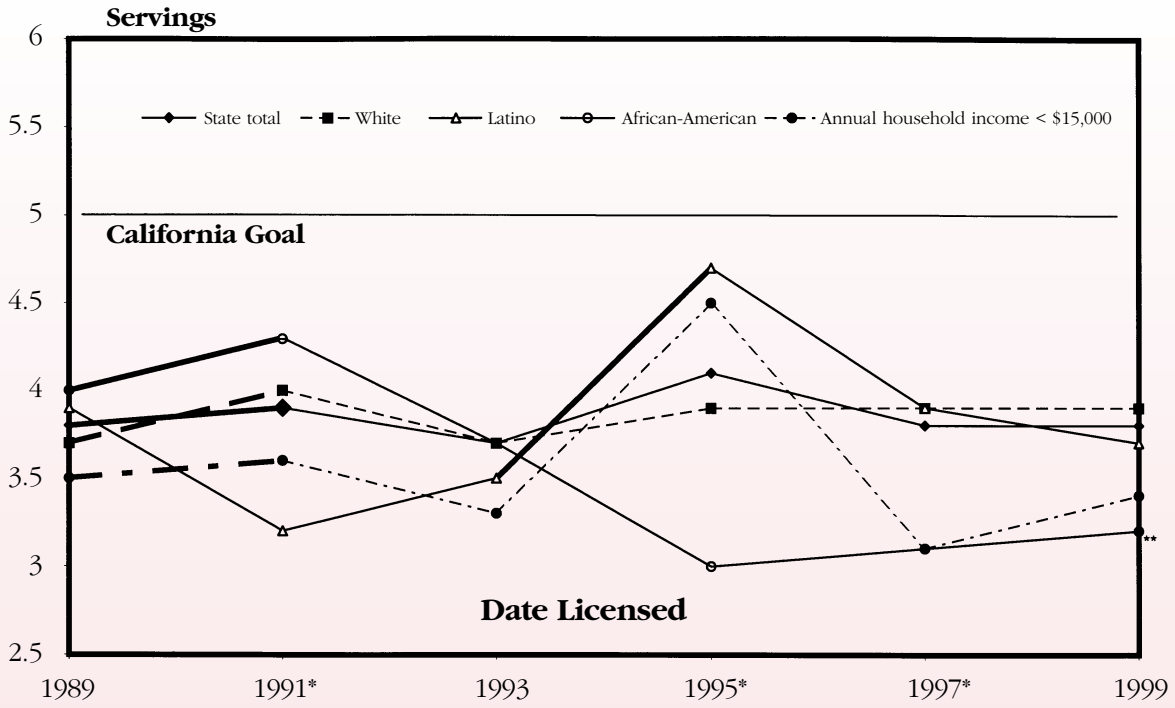
USDA's Federal financial participation (FFP) reimbursement mechanism for food stamp funds provides a one-to-one match with all State expenditures for qualifying nutrition education/social marketing activities, thereby providing an incentive for State public entities to sponsor nutrition education programs. In the second operational year, $4.9 million in FFP funding was approved. Over 1998-1999, $8.2 million was identified, of which more than $3 million in additional FFP funding from USDA was directed to the California 5 a Day—Power Play! Campaign for children, to the Latino 5 a Day Campaign, and to other low-income households through the network. In addition, $1 million was awarded to California Project LEAN, which included its promotion of the 5 A Day message through 10 regional coalitions. In view of the unexpected 7-percent downturn in vegetable and fruit consumption between 1995 and 1997 for the State as a whole (see Figure 1), and especially the 29-percent decrease for persons with annual household incomes of less than $15,000, USDA funds have provided financial resources at a critical time (Foerster et al., 1998b).

Lessons Learned

The biennial State telephone surveys have proven critical in the ongoing development of special State 5 A Day initiatives. The surveys have identified multiple population segments that require more intense interventions, and they have dispelled popular perceptions that high availability of vegetables and fruit is enough to result in good eating practices. These surveys have shown an upturn in reported vegetable and fruit consumption by targeted population segments coinciding with State campaigns followed by downturns when the campaigns ended. For example, during the prototype campaign targeting English-speaking adults (1989 to 1991), consumption among White ($p < .05$) and African-American (NS) adults rose 8-percent instead of the expected 2-percent secular change. Similarly, reported consumption among Hispanic adults rose over 30 percent (NS) following the Latino 5 a Day Campaign (1994 to 1996). In all cases, consumption returned to pre-campaign levels once the promotions ended. The surveys also have shown a consistent, positive association between consumption and the behavior-specific belief that five daily servings are a necessity as well as the ability to name vegetables and fruit as foods that help prevent cancer.

More sophisticated approaches and resources are needed to keep pace with the changing business environment, especially in supermarkets and the mass media. Consolidation in the supermarket industry has decreased the autonomy of produce department executives, caused many companies to focus less on community service, changed the responsibilities of consumer affairs personnel, and increased competition and therefore the cost of in-store support that industry partners needed, such as the addition of interactive computer kiosks instead of signage and brochures. The State government also is using mass media for many different types of campaigns. With the notable exception of Spanish-language media outlets (which remain committed to public service), commercial stations now expect paid advertising. There are more groups seeking limited public service time, and the major networks demand PSAs that require more costly production.

Figure 1. Servings of Vegetables and Fruit Consumed by California Adults, 1989-1999



* p < .001 significant differences among ethnic groups in a survey year.
** p < .05 significant differences from 1989 to 1997 for a population segment.
Note: Bolder lines represent years of prototypes for the California 5 a Day Campaign.
Source: California Department of Health Services, 1999.

Traditional print outlets such as the weekly food pages are still relatively available, but their reach into minority, less educated, or lower income market segments is limited.

It is apparent that to increase vegetable and fruit consumption, the California 5 A Day Campaign needs to support simultaneously various multimedia, retail, food-service, regional, and community projects. This strategy has worked in fields such as tobacco control (CDHS, 1996b; NCI, 1998), but it is a costly and complex undertaking.

SUMMARY

This chapter has presented a variety of approaches to the development and evaluation of low-cost 5 A Day interventions in States ranging in populations from 2.5 to 30 million.

In Connecticut, the outcome evaluation of a State-developed preschool intervention showed a doubling of vegetable and fruit consumption among adult caretakers, and the process evaluation subsequently documented use of the training sessions in a large number of Head Start sites. In Kansas, outcome evaluations in two schools showed that the State-developed program affected children with the lowest consumption rates, significantly raising both the amount and the variety of vegetables and fruit that they ate. These evaluation materials have since been distributed to elementary teachers statewide.

In South Carolina, outreach and training to multidisciplinary school personnel by members of the State Nutrition Council resulted in teacher utilization of the Dole Food Company's "5 A Day Adventures" CD-ROM and other materials by about one-third of the State's lower elementary school teachers. Following training, most teachers integrated the materials into the core subjects, such as science, math, language, and art.

In Arizona, the State Departments of Health Services and Agriculture worked with the mass media, grocery stores, and local health departments to increase and more narrowly focus community interventions on 5 A Day efforts over a period of 4 years. This was followed by a reported 40-percent increase in adults eating five or more daily servings between 1991 and 1996, and increases were highest for the specific vegetables and fruit that were promoted by the program.

In California, the State Department of Health Services worked with marketing orders from produce growers on two separate statewide campaigns using mass media and retail supermarket channels. The first English-language campaign was followed by a reported 8-percent increase over 2 years in vegetable and fruit consumption by White and African-American adults. The second campaign was conducted in Spanish and was followed by a reported 30-percent increase over 2 years in vegetable and fruit consumption among Hispanic adults. In both instances, reported consumption fell significantly when the campaigns ended.

Not surprisingly, these case studies also indicate that the interventions that work the best are interactive, focused, and sustained. Several States used strategies that extended the reach of the programs, such as use of CIS for the distribution of materials and the provision of materials in appropriate languages. Another successful strategy was to integrate 5 A Day activities into other programs (such as Head Start) and into schools and local health department operations.

Whether the State-level approach started small, with just one collaborator, or incorporated large coalitions, the 5 A Day coordinators established effective networks, integrating Government, university, and industry partners. The one State discussed in this chapter that did not use a coalition approach indicated that the lack of such a mechanism made it more difficult to secure funds for continuation of the Program. Table 5 summarizes the results of the 5 A Day efforts in all five States discussed here.

It is also clear that gathering data about Program effectiveness will help programs to expand and that data are sooner or later required for continued funding. However, even in programs that start without an experimental design, outcome and process evaluation results can be valuable. For example, the dramatic increase in the size of the California program was aided by the decision to monitor trends from the outset of the program. In the locations where effective interventions were happening, statewide data indicated improved consumption levels. In fiscally lean years when interventions were cut back, effects were diminished, or consumption rates reverted to pre-campaign levels.

Although well-funded NCI research projects provide less equivocal evidence that 5 A Day interventions change dietary behaviors, knowledge, and attitudes, the State-level evaluations, which are funded at much lower levels and for only 1 year at a time, nonetheless make important and practical research contributions. States benefit by learning from intervention models that were designed and implemented by intermediaries in large systems or corporations that have tremendous reach to consumers. State-level programs also may generate findings that are immediately useful for policy recommendations and for funding decisions by these same intermediaries. This kind of applied research may, in fact, prove to be an extremely practical new strategy for future social marketing and large-scale national public/private partnerships. Such initiatives can target many different population segments through diverse intervention channels, while also reflecting the uniqueness of each State's situation.

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Table 5. Overview of State Case Studies and Their Results

State	*Outcome Evaluated*	*Evaluation Method*	*Main Findings*	*Comment*
Connecticut	Diets of Head Start caregivers and their children who did and did not attend educational sessions	24-hour recalls, 2-day records, Block FFQ, pre- and postintervention	More than doubled vegetable consumption among caregivers, but no change among children	Recruiting intervention participants was a challenge; staff randomly assigned participants to groups
Kansas	Vegetable and fruit consumption of elementary school students in two communities	22-item FFQ[1]	Increased vegetable and fruit consumption among only those with initially low intake in medium-size community	Regression to the mean and possible bias by community
South Carolina	Dole CD-ROM statewide distribution and use reported by teachers	Teacher surveys by mail and fax	Increase in curriculum integration from 1997 to 1998	Low response rates limit conclusions
Arizona	Statewide vegetable and fruit consumption in adults	BRFSS surveys, 1991-1996	Vegetable and fruit consumption increased 17% from 1991 to 1996	Plateau in rate of increase in 1996
California	Statewide vegetable and fruit consumption in adults	Special biennial telephone surveys using 24-hour recalls	Vegetable and fruit consumption increased 8% in White and African-American adults, and more than 30% in Hispanics, following the statewide campaigns; but it dropped after campaigns ended	Sample sizes were too small to show statistically significant changes (African-American and Hispanic segments), but patterns were consistent

[1] FFQ = food frequency questionnaire.

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